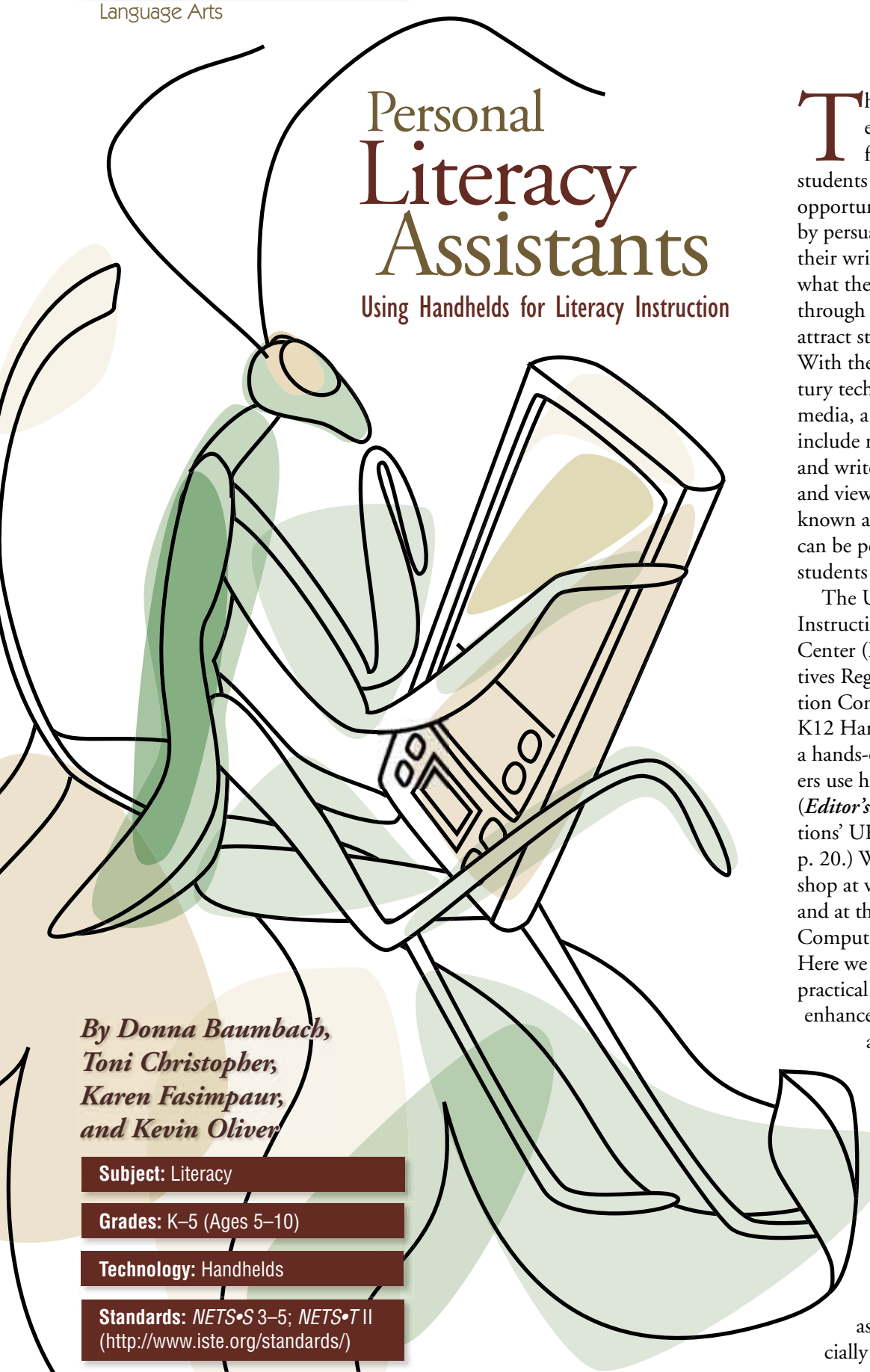
Personal Literacy Assistants

Using Handhelds for Literacy Instruction



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Subject: Literacy

Grades: K–5 (Ages 5–10)

Technology: Handhelds

Standards: *NETS•S* 3–5; *NETS•T* II (http://www.iste.org/standards/)

The fundamental goal of literacy is to construct meaning from language. Teachers help students become literate by providing opportunities to listen to read-alouds, by persuading them to investigate their writing process, by discussing what they have heard and read, and through other activities designed to attract students to the world of words. With the emergence of 21st century technology and the use of mass media, a definition of literacy must include not only the ability to read and write, but also to listen, speak, and view. Handheld computers (also known as personal digital assistants) can be powerful tools for engaging students in literacy learning.

The University of Central Florida's Instructional Technology Resource Center (ITRC), the SouthEast Initiatives Regional Technology in Education Consortium (SEIR*TEC), and K12 Handhelds teamed to design a hands-on workshop to help teachers use handhelds to teach literacy. (***Editor's note:*** Find these organizations' URLs and other resources on p. 20.) We have presented this workshop at various state conferences and at the 2004 National Educational Computing Conference (NECC). Here we provide a lesson plan and practical guidance for using handheld-enhanced lessons in classrooms. We also mention specific programs you can use with your students. Some of the software we reference is free or shareware, but if students are to maximize the benefits of handheld technology, some software will need to be purchased. The more sophisticated programs, such as assessment tools or commercially published ebooks, must be

purchased, and schools should budget for those resources. Many of the utilities mentioned here are for both Palm OS and Pocket PC handhelds, but some are for Palm OS only. Check the URLs for each utility to see which handheld platforms are supported.

A Sample Lesson Plan

To illustrate how you can use handheld computing tools to enhance existing lesson plans, we introduce a sample lesson plan from the Great Resources for Integrating Technology in Schools (GRITS) Web site. The "autobugography" lesson plan allows students to touch on many of the components of literacy and to combine scientific research with creative writing. It touches on all of the key components of literacy: reading, writing, listening, speaking, and viewing. Each participating class explores their surroundings in search of insects about which to write *autobugographies*—short stories written from the insect's point of view (first person) and accompanied by the insect's digital portrait. You can view archived student work on the GRITS site. When your project is completed, you can submit your students' work—samples may be added to the archive for others to view in the future.

Introduction and Brainstorming. First, explain to students that they will be doing a project about bugs. They will write a story from the bug's point of view, an autobugography! But first they will need to learn more about bugs and one bug of their choice. To help students select a bug, you can use ThoughtManager to create and beam an ABC strategy worksheet to their handhelds. The ABC strategy contains the 26 letters of the alphabet, and students are asked to brainstorm as many bugs as they can think of that begin with each letter. Ask each student to select a specific bug, then use PicoMap or Inspiration for the Palm OS to outline their selections. Students are asked if any of the bugs should be grouped together in specific categories (e.g., bees), and you then map these relationships. The Margi Presenter-to-Go connector allows you to display your handheld screen through a standard LCD projector.

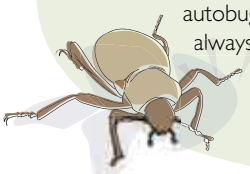
Research. After selecting a specific bug, students can use iKWL to record what they know about their bug, what they would like to learn, and later, what they have learned. Next, students research their bugs to gather information needed to write autobugographies. Prior to research, use Inspiration for the Palm OS, ThoughtManager, or even the handheld's to-do list feature to provide students with guiding questions for their research: Where do I live? What do I eat? What do I look like? and What happened to me today? Students can use AvantGo to move Web pages and graphics from desktop computers to the their handhelds for research. eReader and FlingIt also help bring files from the Web to the handheld. Encourage students to use a variety of resources for research, including library books, reference books, Web sites, ebooks, maps, and CD-ROMs. Noah Lite is a free dictionary tool students can use to look up unfamiliar terms they encounter during research. To build phonics and word recognition into the lesson, encourage students to locate and pronounce their bug's scientific name, sounding out each phoneme. You could also use the Quizzler application to create "flash cards" for vocabulary. Show students insects in motion using short movies on Kinoma Player and provide photos and clip art for student motivation and use in their reports.

Writing and Presenting. To help students organize their writing, provide a fill-in-the-blank worksheet using a handheld word processor such as Documents to Go. Students write down the information they have found through research and reading. Sentences should be in first person and written from the bug's point of view (e.g., "I am a …" "I live in …" "I eat…").

My name is (remember, you are a bug!) …
My scientific name is …
You can find me living …

Beetle, by Dylan

I am a beetle. My habitat is dry, dead leaves on the ground. I can also burrow into the ground. My menu is other small insects, like gnats or ants. I came from an egg and my life style is pretty much hunt, eat, sleep, get hunted, run for my life, try not to get eaten, and the occasional dodging of humans. My habitat helps me with camouflage. How it helps me is because my color (red and gray) blends in with the red and dark colored leaves. My life cycle is first an egg, then I'm larva. After that I go to the pupa stage. Next, I'm a nymph. Last, I'm an adult. Now I'm an adult looking back on my life and putting it into this autobugography. Some of my worst predators are those pesky birds. They're always hunting me and eating me. Well, that's all I have to say about the story of my life, so I guess this is where my story ends.



An example autobugography created by a fourth grader.

If you looked at me, you would describe me like this …
I like to eat …
My worst enemy is …
I really like to …
My friends are …

When finished completing their worksheets, students sync them back to your computer and read their sentences aloud. You help students determine if they have enough information to begin creating their stories.

After students finish editing their stories, they can publish them as an ebook. Students save their word processed files in rich text format, then open them in the eBook Studio program, where text can be formatted in ebook style. Students sync and install ebooks on their handhelds, then read them aloud to small reading groups. Students in a reading group can share their ebooks by beaming them to one another. After presenting their work, students should complete their iKWL charts, adding what they have learned in this lesson.

Assessment. To assess the Autobugography assignment, we recommend two instruments: a student checklist and a teacher rubric. The student checklist provides students with a way to keep track of their progress on the project. The student checklist may be disseminated electronically using the handheld's To Do List application, allowing students to electronically track and check off the project components they have completed. The To Do List application also allows students to take notes on the project components, so when their checklist is beamed back to the teacher, he or she can assess the work of the students in greater detail.

The teacher rubric provided for this project covers two key areas in assessing student work: technology integration and language usage. It is posted in the Autobugography section of the GRITS Web site. You can reconstruct and modify this rubric for use on the handheld using the HanDBase database or ThoughtManager. You can sync this data with your desktop computer and analyze it later using a database manager, such as Access or Filemaker Pro. For reading instructors who wish to incorporate a reading assessment into this assignment, we recommend asking students to read a prepared work on insects. The Learner Profile and Wireless Generation applications for desktop computers and the handheld are excellent tools for marking student accomplishment of specific state reading indicators.

Literacy Terms and Tools

Literacy is more than just reading. In fact, it is a set of skills, including reading, writing, listening, speaking, and viewing. Handhelds can help teachers teach and assess these skills.

Reading. Learning in all content areas is supported by strong reading comprehension strategies and study skills. Students need to know how to apply a variety of reading comprehension strategies to different types of texts, analyze the structures and features of expository (informational) texts, and select and vary their reading strategies for different texts and purposes. Skills that can be fostered through handhelds include thinking about reading, predicting, questioning, summarizing, and retelling. Traditional tools for these activities are now available in handheld versions, such as PiCoMap or Inspiration for the Palm OS. Web clipping programs (e.g., FlingIt) and ebook readers (e.g., eReader) allow students ready access to electronic texts. Finally, reference tools (e.g., Noah Lite) and word games (e.g., crossword puzzles from Handmark or Beret Applications) help increase students' vocabulary. You can create quizzes using Quizzler to assess students' reading comprehension.

Writing. The writing process normally consists of prewriting, drafting, revising, editing, and publishing. Students need many opportunities to write about what they are learning. Writing forces organization. It helps us see clusters of information and hierarchies of ideas. Because it is such a powerful vehicle for learning and thinking, it should be integrated into almost every aspect of instruction.

Computers have been very helpful to some students in the writing process. Those who lack the fine motor skills to create legible penmanship have found the computer keyboard to be a welcome assistant. Students who once tore their papers while editing and erasing find the delete key a helpful tool. Spelling and grammar checkers also help students create more pleasing and polished work. Full-sized keyboards and full-featured word processing programs are available for many handhelds. Handheld programs such as outlining tools and graphic organizers (e.g., iKWL) are also useful in prewriting and writing. The word processor FreeWrite allows students to practice and improve their writing.

Listening. Listening comprehension can be defined as the ability to recall and understand information that is presented orally. This information might be presented through the oral reading of a book, film or video, a recorded message, or any other auditory device. Also helpful are the built-in sound recording and playback features on many handhelds.

Because research indicates that listening comprehension augments reading comprehension, it is important for professional educators to incorporate listening skill development into the curriculum. Because many handheld devices have multimedia capabilities, they can record and play sound files, display images, and show animation and film clips—helping students to practice listening. Sounds can be repeated, played through headphones, and adapted to the needs of individual students.

Speaking. Human beings communicate primarily through speech. Children seem born not just to speak, but also to interact socially. Handheld devices support speaking by enabling students to hear stories read aloud. In addition, the built-in voice recorders in many handhelds allow students to record and listen to their own reading or to practice an oral presentation, playing it back to critique and improve themselves. These devices are an improvement over standard analog tape recorders because they allow random access and easy re-recording. Further, these digital recordings are easy for students to share with each other, post on a Web page, include in their digital portfolios, and match with the text version of the book to create their own talking books.

Viewing. Visual images have language and meaning. Visual literacy can be defined as the ability to understand and produce visual messages. Handhelds support viewing by allowing students to view pictures and graphics. Students can use built-in cameras, both still and motion, to record images to write about later, to describe an activity or share an observation, or to document an event. Images can be used in stories, ebooks, or reports. Students can use drawing tools to interpret what they have seen, to show understanding of what they have read or heard, or to animate a sequence of activities.

Assessment. You can use handhelds in the assessment process. Quizzes and electronic worksheets can be generated and distributed to student handhelds, and students' scores with item analyses can be beamed back to a teacher's gradebook. Rubrics and checklists can be used in authentic assessment of students' skills, and several companies produce handheld assessment tools created especially for literacy, such as Wireless Generation's DIBELS and Reading Records.

Conditions Necessary for Student and Teacher Success

To implement this lesson effectively, students need access to the appropriate handheld hardware and software. One of the benefits of handhelds is their low cost, which makes one-to-one student-to-computer ratios possible, and this lesson is best implemented when each student has his or her own handheld. In addition, it may be helpful to have keyboards available for students. Although our experience is that students are quite adept at mastering the handwriting recognition used by handhelds, using keyboards gives the opportunity to reinforce keyboarding skills.

Realistically, the full implementation of the autobugography lesson

plan would take from four to five sessions, depending on student and teacher expertise with the various handheld applications. The lesson will go most smoothly if students have already had experience with the handhelds and with the programs being used.

However, if teachers do not have this much time, many variations on the autobugography lesson are possible. One teacher implemented a portion of this lesson by focusing on the brainstorming, reading, and research part of the lesson, opting to save the final writing project for another time. The fourth graders who participated had not used handhelds extensively before the lesson, and so, one of the lesson objectives was to help them gain familiarity with the technology. As is commonly found with handhelds, the students became comfortable with the technology very quickly and had little difficulty mastering its use.

You can adapt this lesson plan to fit the students' needs, time available, and resources on hand. Although maximum benefits may be gained by teaching the entire lesson as presented with activities that support all areas of literacy, this approach may not be feasible for every classroom. Experiment and adapt the lesson so that it works best for your specific needs.

As with other types of technology, professional development for teachers using handhelds is critical. Professional development on integrating handhelds into the literacy curriculum should include not only technical training, but also support on implementation strategies and classroom management tips. Because handhelds are relatively easy to use from a technical standpoint, less training is required on this, and more time can be devoted to integration strategies. Teachers often find handhelds easier to integrate into the classroom than traditional desktop technology, because the handhelds are small and mobile. Handhelds represent a new tool for teachers though, and teachers should be given adequate time and support to integrate handhelds into the classroom.

Conclusion

We know that computers can be used in many ways to promote literacy, however most students do not have adequate access to computers to make substantial differences in performance. Very few students have 24/7 access to technology. Many students do not have computers at home. Even in well-equipped schools, the ratio of computers to students rarely reaches 1:1. With the increasing power and decreasing prices of handheld computers, students can have access to computers whenever and wherever they need them. This makes a significant difference in student gains from technology use. With the rich selection of software tools available and thoughtful lesson plans, handheld computers can be an effective tool for advancing literacy in the classroom.

Resources

Beret Applications: http://www.beret.com
Documents to Go: http://www.dataviz.com/
eBook Studio: http://www.palmdigitalmedia.com/products/ebookstudio
eReader: http://www.palmdigitalmedia.com/products/palmreader/free
FlingIt: http://www.goknow.com/Products/FlingIt/
Florida's Instructional Technology Resource Center: http://www.itrc.ucf.edu
FreeWrite: http://www.goknow.com/Products/FreeWrite
Great Resources for Integrating Technology in Schools (GRITS): http://www.grits online.org/
HanDBase database application: http://www.ddhsoftware.com/
Handmark: http://www.handmark.com
iKWL: http://www.palm.hice-dev.org/beta.php
Inspiration: http://www.inspiration.com
K12 Handhelds: http://www.k12handhelds.com
Kinoma Player: http://www.kinoma.com/

Margi Presenter-to-Go: http://www.margi.com/products/prod_ptg.htm
Noah Lite: http://www.arslexis.com
PiCoMap: http://www.goknow.com/Products/PiCoMap/
Quizzler: http://www.pocketmobility.com/downloads/quizdownloads.html
SouthEast Initiatives Regional Technology in Education Consortium (SEIR*TEC): http://www.seirtec.org
ThoughtManager: http://www.handshigh.com/html/thoughtmanager.html
Using Handheld Technology to Improve Literacy Skills [NECC 2004 Workshop Details]: http://center.uoregon.edu/ISTE/NECC2004/program/search_results_details.php?sessionid=28912
Wireless Generation: http://www.wirelessgeneration.com/web/

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A nationally known expert on the educational use of handheld technology, Karen Fasimpaur has worked with schools across th United States on the use of handhelds. Ms. Fasimpaur, president of K12 Handhelds, is the author of the award-winning book 101 Great Educational Uses for Your Handheld Computer *and has taught elementary and adult education.*

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